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AUTHOR Schunk, Dale H.
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ABSTRACT

An experiment involving 30 sixth graders with learning disabilities in mathematics tested the hypothesis that participation in goal setting enhances achievement outcomes. Ss received subtraction training that included instruction and practice opportunities over several sessions. Some Ss set proximal performance goals each session, others had goals assigned, and others received training but no goals. Although proximal goals promoted motivation more than no goals, participation in goal setting led to the highest self efficacy and subtraction skill. It is suggested that participation in goal setting may help promote more active task engagement. (Author/CL)

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Participation in Goal Setting Among Learning Disabled Children

Dale H. Schunk
College of Education
University of Houston
Houston, TX 77004

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Abstract

This experiment tested the hypothesis that participation in goal setting enhances achievement outcomes. Subjects were sixth-grade children who previously had been classified as learning disabled in mathematics. Children received subtraction training that included instruction and practice opportunities over several sessions. Some children set proximal performance goals each session, others had comparable proximal goals assigned, and children in a third condition received the training but no goals. Although proximal goals promoted motivation more than no goals, participation in goal setting led to the highest self-efficacy and subtraction skill. Implications for teaching are discussed.

Participation in Goal Setting Among Learning Disabled Children

Bandura's theory of self-efficacy states that different treatments change behavior in part by creating and strengthening a sense of self-efficacy (Bandura, 1977a, 1981, 1982). Self-efficacy refers to judgments of how well one can perform actions in specific situations that may contain ambiguous, unpredictable, and stressful features. Self-efficacy is hypothesized to influence choice of activities, effort expenditure, perseverance, and task accomplishments.

Although self-efficacy theory originally was employed to explain coping behaviors in fearful situations, research has applied it to other contexts including children's cognitive skill acquisition (Schunk, 1981, 1983a, 1983b). This latter research has shown that educational practices are important contextual influences on self-efficacy and differ in the type of information they convey (Schunk, in press). In turn, self-efficacy affects skillful performance.

This study repesents an extension of self-efficacy theory to children with learning disabilities. By definition, learning disabled children do not possess intellectual deficits but perform below their measured abilities. Repeated difficulties in school result in academic deficiencies and interfere with general

self-functioning (Palmer, Drummond, Tollison, & Zinkgraff, 1982). In the self-efficacy model, such deficiencies can engender a sense of inefficacy for coping with cognitive demands. Compared with nondisabled students, those with learning disabilities hold a lower sense of cognitive competence (Evans, 1983; Lincoln & Chazan, 1979). Self-doubts about one's capabilities are associated with adverse emotional reactions, lackadaisical efforts, and lower skill development (Bandura, 1982; Schunk, in press).

One common educational practice is goal setting. Comparing one's present performance level with a desired standard can motivate efforts toward improvement (Bandura, 1977b). Of central importance are goal properties: specificity, difficulty level, and proximity (Bandura, 1977b; Latham & Yukl, 1975; Locke, 1968; Locke, Shaw, Saari, & Latham, 1981). Goals that incorporate specific performance standards lead to higher performance than no explicit or general goals, such as, "Do your best" (Locke, 1968; Locke et al., 1981). Assuming that individuals have sufficient ability, a positive relationship exists between difficulty level and performance (Locke el al., 1981). Proximal goals, which are close at hand, result in greater motivation than goals extending farther into the future (Bandura, 1977b). Research with children investigating different goal properties shows that goals enhance performance (Bandura & Schunk, 1981; Gaa, 1979; Rosswork, 1977;

Schunk, 1983a, 1983b; Tollefson, Tracy, Johnsen, Buenning, & Farmer, 1982).

One purpose of the present study was to explore the effects of proximal goals on learning disabled children's self-efficacy and skillful performance during a subtraction training program. Some children pursued goals of completing a certain number of pages of problems each session, whereas others worked without goal instructions. Proximal goals can instill in children an initial sense of self-efficacy for performing well, which is substantiated later as children observe their progress toward the goal (Schunk, in press). Feelings of efficacy sustain motivation and foster skill development (Schunk, 1983a). Goal attainment, or even a close approximation, further validates self-efficacy (Schunk, 1983b). In the absence of goals, children should be less sure about their capabilities because they lack a standard against which to gauge progress. Self-doubts do not promote self-efficacy or skills (Schunk, in press).

Within this context, this study tested the idea that participation in goal setting enhances achievement outcomes. Half of the proximal-goal children set their own session goals, whereas comparable goals were assigned to the other half. There are at least two ways that participation can affect performance (Locke et al., 1981). Participation often leads to self-set goals that are more difficult to attain than assigned goals, and goal difficulty

increases performance (Locke et al., 1981). This possibility was controlled in the present study because goals were equated for difficulty across corditions.

Participation also can result in a high degree of goal commitment, which increases performance (Locke et al., 1981). People are more apt to accept goals when they believe they can attain them (Mento, Cartledge, & Locke, 1980). Further, participation may be especially beneficial for persons low in need for achievement, who initially may hold low expectations for success (Steers, 1975).

Children who set their own goals were expected to demonstrate the highest self-efficacy and skills. It was felt that participation would lead to high expectations for goal attainment. This sense of efficacy for performing well should be substantiated later as children solved problems. In contrast, assigned-goals children might not experience a correspondingly high initial sense of efficacy. Given their prior difficulties in arithmetic, it seemed possible that they could perceive the goals as too difficult. To the extent that they felt somewhat less certain of their subtraction capabilities, such uncertainty would not foster self-efficacy or skills quite as well.

Method

Subjects

The sample included 30 sixth-grade children from two middle

schools (grades six to eight). Ages ranged from 12 years 2 months to 14 years 7 months (M = 13.5 years). The 15 boys and 15 girls were predominantly middle class. All children previously had been identified by the school district as learning-disabled in mathematics according to state guidelines and were receiving special education services. Their intelligence scores (WISC-R) ranged from 85-110 (Wechsler, 1974), and their mathematical achievement scores, as assessed by the Woodcock-Johnson Psycho-Educational Battery (Woodcock & Johnson, 1977), ranged from 1-1.5 SDs lower than their WISC-R scores.

Because this study focused on processes whereby skills could be developed when they were lacking initially, children's resource teachers were shown the subtraction skill test and identified students who they felt could not solve correctly more than 25% of the problems. These children were administered the pretest individually by one of two female adult testers drawn from outside the school.

Pretest

Self-efficacy judgments. Children's self-efficacy for solving subtraction problems correctly was measured following procedures of previous research (Bandura & Schunk, 1981; Schunk, 1983a, 1983b). The efficacy scale ranged from 10 to 100 in 10-unit intervals from high uncertainty (10), through intermediate values (50-60), to complete certitude (100). Children initially

received practice by judging their certainty of successfully jumping progressively longer distances. In this concrete fashion, children learned the meaning of the scale's direction and the different numerical values.

Following this practice, children were shown 25 sample pairs of subtraction problems for about 2 s each. This brief exposure allowed assessment of problem difficulty but not actual solutions. The two problems constituting each pair were similar in form and difficulty to one problem on the ensuing skill test although they involved different numbers. Children were judging their capability to solve different types of problems and not whether they could solve any particular problem. Children made each judgment privately by circling an efficacy value. They were advised to be honest and mark how they really felt. Scores were summed across the 25 judgments and averaged.

Subtraction skill test. The skill test was given next. It included 25 subtraction problems ranging from 2-6 columns. Each problem tapped one of the following operations: no borrowing, borrowing once, borrowing from a one, borrowing twice, borrowing caused by a zero, and borrowing across zeros. Of these 25 problems, 12 were similar to the problems that children solved during the subsequent training sessions, whereas the other 13 were more complex. For example, during training children solved problems requiring double borrowing, whereas some skill test

problems required triple borrowing. The measure of skill was the number of problems solved correctly.

The tester presented the problems one at a time and instructed children to examine each problem, decide how long they wanted to spend on it, and place each page on a completed stack when they finished solving the problem or chose not to work on it any longer. Children were given no performance feedback.

Training Procedure

Following the pretest, children were assigned randomly within sex and school to one of three treatment groups (*ns* = 10) and received 45-min training sessions over five consecutive school days, during which they worked on a packet consisting of seven sets of material. These sets were ordered from least to most difficult as follows: no borrowing, borrowing once in two-column problems, borrowing once in three-column problems, borrowing caused by a zero, borrowing twice, borrowing from a one, and borrowing across zeros (Friend & Burton, 1981). The format of each set was identical. The first page contained written explanation of the subtraction operation and two step-by-step worked examples. The next six pages each contained several similar problems to solve. Each explanatory page fully covered the operations required to solve the problems on the following six pages.

Children were seated individually in the resource room by one

of two female adult proctors, and worked at sufficient distances from others to preclude contact. Each proctor was responsible for approximately equal numbers of children in each experimental condition. Initially, the proctor reviewed the first explanatory page by pointing to the operations while reading from the narrative that explained the steps. She explained that whenever children came to a similar page they were to bring it to her for review. The proctor then gave the appropriate goal instructions, stressed the importance of careful work, and moved out of sight. Children solved problems alone and received no feedback on the accuracy of their solutions. At the end of each session, they marked their places and resumed there the following day.

Treatment Conditions

Self-set goals. To children assigned to this condition, the proctor suggested at the start of each session that they establish a performance goal as follows:

> While working problems it helps to have something in mind that you're trying to do. For example, you could try to work a certain number of pages today. Why don't you decide how many pages you think you could work today? Choose a number between 4 and 10 pages. Of course, if you do more that's even better, but you should try to work at least the number of pages that you choose. How many pages would you like to try to work?

The proctor departed once children established a goal. Upper and lower page limits were prescribed because learning disabled children often set unrealistic goals (Robbins & Harway, 1977; Tollefson et al., 1982). These limits were derived from a pilot study in which comparable subjects worked without goals, and represented their average number of pages completed. At the end of each session, the proctor totaled the pages completed and compared the total with the goal (over, same, under).

Assigned goals. The proctor gave these children the following instructions at the start of the first session.

> While working problems it helps to have something in mind that you're trying to do. For example, you could try to work a certain number of pages today. Why don't you try to work 7 pages today? Of course, if you do more that's even better, but you should try to work at least 7 pages.

Seven pages represented the average goal established by self-set children during the first training session. For each session, the goal suggested to assigned-goals subjects was the self-set condition's average for the corresponding session. This procedure equated goal difficulty across conditions. The proctor totaled pages at the end of each session and compared it to the goal.

No goals. These children received the subtraction training but no goal instructions. Because the self-set and assigned-goals

conditions included goals and feedback, it was decided to disentangle these effects. Thus, the proctor totaled pages completed at the end of each session and informed no-goals children of their total.

Expectancy of Goal Attainment

After receiving goal instructions at the start of each session, self-set and assigned-goals children judged their expectancy of goal attainment on a scale identical to the self-efficacy scale. Judgments from the five sessions were averaged. To control for potential effects of making judgments, no-goals children judged their expectancy of "Doing your best." These latter judgments otherwise are not relevant, and will not be discussed.

Posttest

The posttest was administered the day following the last session. Instruments and procedures were similar to those of the pretest except that a parallel form of the skill test was used to eliminate possible problem familiarity. For any given child, the same tester administered the pre- and posttests, had not served as the training proctor, and was blind to the child's treatment condition. All tests and training materials were scored by an adult who was unaware of children's experimental assignments.

Results

Means and standard deviations of all measures are presented

by experimental condition in Table 1. Preliminary analyses of variance revealed no significant differences due to tester, school, or sex of child on any measure, nor any significant interactions. The data were pooled across these variables. There also were no significant differences between experimental conditions on the pretest measures. Posttest measures were analyzed with analysis of covariance using the appropriate pretest measure as the covariate. The three experimental conditions constituted the treatment factor. Significant F ratios were analyzed using the Newman-Keuls test (Kirk, 1968)

Insert Table 1 about here

The use of analysis of covariance necessitated demonstration of slope homogeneity across experimental conditions (Kerlinger & Pedhazur, 1973). Tests of slope differences for each measure were made by comparing a linear model that allowed separate slopes for the three conditions against a model that had only one slope parameter for estimating the pretest-posttest relationship pooled across the three conditions. These analyses found the assumption of slope homogeneity across treatments to be tenable.

Self-Efficacy

ANCOVA yielded a significant between-condition difference, $F(2, 26) = 4.96$, $p < .05$. Post hoc analyses revealed that

self-set children judged self-efficacy higher than assigned-goals ($p < .05$) and no-goals subjects ($p < .01$). The latter two conditions did not differ.

Skill

A significant between-condition difference was obtained, $F(2, 26) = 4.10$, $p < .05$. Post hoc analyses showed that the self-set condition demonstrated higher subtraction skill than the assigned- and no-goals groups ($ps < .05$). Subtraction skill of the latter two conditions did not differ.

Training Progress

To determine whether goal treatments differentially influenced rate of problem solving during training, the number of problems completed was analyzed with ANOVA. A significant treatment effect was obtained, $F(2, 27) = 7.64$, $p < .01$. Newman-Keuls comparisons showed that both the self-set ($p < .01$) and assigned-goals ($p < .05$) conditions solved more problems than no-goals subjects, but the two former conditions did not differ. These higher problem-solving rates were not attained at the expense of accuracy, because similar results were found using the number of problems solved correctly.

Expectancy of Goal Attainment

The self-set and assigned-goals conditions differed significantly on this measure, $F(1, 18) = 12.55$, $p < .01$. Self-set children held higher expectations for goal attainment.

Correlational Analyses

Correlations were computed between theoretically relevant variables. Initially, correlations were computed separately for each experimental condition. Because there were no significant between-condition differences, correlations were averaged across conditions using an r to z transformation (Edwards, 1976).

Among proximal-goals children, expectancy of goal attainment was related to training progress (number of problems completed), $r(18) = .58$, $p < .01$, and posttest self-efficacy, $r(18) = .51$, $p < .05$. For all subjects, more rapid problem solving during training was associated with higher posttest self-efficacy, $r(28) = .67$, $p < .01$, and skill, $r(28) = .43$, $p < .05$. The same pattern of results was obtained using the number of problems solved correctly as the measure of training progress. Posttest self-efficacy bore a positive relationship to subsequent skill, $r(28) = .77$, $p < .01$.

Discussion

This study shows that participation in goal-setting enhanced learning disabled children's achievement outcomes. The differences between the two proximal-goal conditions cannot be due to training performance variations because these groups made comparable progress, nor to variations in goal difficulty, which has confounded much research on participation (Locke et al., 1981).

An explanation for these effects is as follows. Allowing

children to establish goals yielded high expectations for goal attainment. This initial sense of efficacy for performing well likely was validated as children observed their goal progress, as well as by goal attainment or a close approximation (Schunk, in press). In turn, a strong sense of self-efficacy leads to skillful test performance. Although assigned-goals children performed as well during training, their lower initial expectancy of goal attainment may have left them somewhat more in doubt about their capabilities, which can affect test performance.

These results conflict with those of Bandura and Schunk (1981), who found with nondisabled, skill-deficient children that proximal assigned goals enhanced self-efficacy and subtraction skill compared with no goals. A major difference between these studies is the type of subjects. Compared with nondisabled students, learning disabled children often judge academic expectations lower (Bryan & Bryan, 1981). Past difficulties in arithmetic may have been largely responsible for assigned-goals subjects viewing their goal attainment chances with some uncertainty. Although goal attainment expectancies were not assessed by Bandura and Schunk, their proximal-goals children may have felt more certain than the present assigned-goals subjects. Participation in goal setting may be most beneficial for children who possess cognitive deficiencies and generally hold low expectancies for success. Participation may be less important

when children approach tasks with greater self-assuredness.

Upper and lower limits were placed on goal choices because learning disabled students often establish inappropriate standards and do not systematically use performance information in selecting goals (Robbins & Harway, 1977; Tollefson et al., 1982). Unrealistically high or low goals will not facilitate self-efficacy or skill development (Bandura, 1977b). Goals beyond one's capabilities result in failure and low self-efficacy, whereas goals set too low provide no new information about one's capabilities. Training in goal setting often may be necessary prior to any type of systematic goal application (Sagotsky, Patterson, & Lepper, 1978; Tollefson et al., 1982).

This study supports the theoretical notion that, although self-efficacy is influenced by prior performances, it is not merely a reflection of them (Bandura & Schunk, 1981; Schunk, 1983a, 1983b). The two proximal-goal conditions did not differ in rate of problem solving during training, but self-set children judged posttest efficacy higher. This study also supports the idea that self-efficacy bears an important relationship to subsequent achievement (Schunk, 1981). Personal expectations for success are viewed as important influences on behavior by a variety of theoretical approaches (Bandura, 1982; Covington & Omelich, 1979; Kukla, 1972; Moulton, 1974; Schunk, in press; Weiner, 1979).

This research has implications for teaching. Learning disabled children often are unwilling to attempt tasks—including those at appropriate ability levels—and may work halfheartedly (Thomas, 1979). Participation in goal setting may help promote more active task engagement. Goal setting can be implemented easily in schools (Gaa, 1973). Although children initially may require training or other assistance in establishing goals (Tollefson et al., 1982), as they work at the task they should become better informed of its demands and their capabilities to meet them. Participation in goal setting may enhance children's skills and sense of efficacy for applying them.

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Table 1

Means (and Standard Deviations)

Measure	Phase	Experimental Condition: Self-Set Goals	Assigned Goals	No Goals
Self-Efficacy[a]	Pretest	51.4 (17.8)	49.1 (20.6)	47.8 (15.9)
	Posttest	86.7 (7.0)	69.3 (25.6)	60.1 (19.8)
Skill[b]	Pretest	5.0 (2.4)	6.3 (4.4)	4.9 (2.9)
	Posttest	14.8 (4.6)	9.8 (6.2)	8.9 (4.5)
Training Progress[c]	---	232.4 (34.7)	206.5 (49.5)	158.0 (44.0)
Goal Attainment[d]	---	86.0 (13.5)	55.0 (24.2)	---

Note. N = 30; ns = 10.

[a]Average score on 25 judgments; range of scale: 10 (low) - 100.

[b]Number of correct solutions on 25 problems.

[c]Number of problems completed.

[d]Range of scale: 10 (low) - 100.